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Susan Morse
Suite 150
12200 Sunrise Valley Drive
Reston, VA 20191

EXAMINER

SINGH, DALZID E

ART UNIT PAPER NUMBER

2633

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3

Please find below and/or attached an Office communication concerning this application or proceeding.

2

Office Action Summary

Application No.

09/817,629

Applicant(s)

ANTONIADES ET AL.

Examiner

Dalzid Singh

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3 and 22, recite "...the predetermined amount is 0.5" It is unclear what factor is represented by such value (i.e., 0.5). For example, is this value representing optical power of a particular channel? Is it representing the OSNR (Optical Signal-to-Noise Ratio) value? Therefore, claims 3 and 22 are indefinite for failing to particularly point out what factor does 0.5 represents.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4-6, 10-21 and 23-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Dugan et al (US Patent No. 6,157,475).

Regarding claims 1 and 14, Dugan et al disclose WDM system, as shown in Fig. 2, for a transmission system between a transmission terminal (12) and a reception

terminal (32) having at least two channels (for example, CHAN1 and CHAN2) the system comprising:

a processor (48) which determines an adjustment for equalizing a predetermined characteristic for each channel and reduces the adjustment by a predetermined amount (see col. 3, lines 59-63 and col. 4, lines 2-6, 14-46); and,

a plurality of controllers (for example, plurality of optical regulator (OR) connected to each transmitter), each controller associated with a transmitter in the transmission terminal, wherein each controller receives the reduced adjustment for an associated channel and provides the reduced adjustment to an associated transmitter (see col. 3, lines 59-67 to col. 4, lines 2-6, 14-46).

Regarding claims 2, 16, 21 and 31, Dugan et al teach that the predetermined amount is determined in accordance with a profile of the quality of the signal (in col. 4, lines 14-28, Dugan et al teach that the output signal from detector is compared with a reference signal (i.e., profile of the quality of signal) and in response provides feedback in accordance to the comparison).

Regarding claims 4, 15, 17, 23, 30 and 32, Dugan et al teach that the predetermined amount is obtained in accordance with a relative influence of noise and fiber non-linearities in the system (in col. 4, lines 38-46, Dugan et al teach feedback signal which adjust the optical attenuator to a predetermined amount; feedback is provided in accordance with signal-to-noise ratio, which measures noise in the system).

Regarding claims 5 and 24, Dugan et al teach that the predetermined characteristic is optical power (in col. 4, lines 38-41, Dugan et al teach feedback signal

to adjust the optical regulators to a predetermined amount to regulate power level of the optical signal).

Regarding claims 6 and 25, Dugan et al teach that the predetermined characteristic is optical signal to noise ratio (in col. 4, lines 44-46, Dugan et al teach feedback signal to adjust the optical regulators to a predetermined, wherein the adjustment amount may be determined by signal-to-noise ratio).

Regarding claims 10, 18, 26 and 33, Dugan et al teach that the processor receives measured signals of the predetermined characteristic and determines the adjustment in accordance with the measured signals (in col. 4, lines 24-41, Dugan et al teach that the signal is received and compared with the signal from microcontroller and further provide a feedback signal to adjust the optical attenuator accordingly).

Regarding claims 11, 19, 28 and 35, Dugan et al teach that the processor calculates the predetermined characteristic in accordance with physical parameters (for example, amplified spontaneous emission noise from optical amplifier) of the transmission system (in col. 4, lines 29-46, Dugan et al teach that microprocessor controller compare the signal with a reference signal, and provide feedback; which indicates that the microprocessor controller calculates predetermined value of the feedback signal in order to adjust the optical power attenuator appropriately).

Regarding claims 12, as shown in Fig. 2, Dugan et al show that the controllers are provided at an output of an associated transmitter (for example, controller OR(46) is provided at the output of transmitter(14)).

Regarding claim 13, as shown in Fig. 2, Dugan et al show that the controllers are integral with associated transmitters (for example, the controllers are coupled to the associated transmitters).

Regarding claim 20, Dugan et al disclose WDM system, as shown in Fig. 2, for a transmission system between a transmission terminal (12) and a reception terminal (32) having at least two channels (for example, CHAN1 and CHAN2), the system comprising:

- determining an adjustment for equalizing a predetermined characteristic for each channel (see col. 3, lines 59-63 and col. 4, lines 2-6, 14-46);

- reducing the adjustment by a predetermined amount (the feedback signal adjust the optical attenuator by reducing or increasing the power level); and

- controlling an output of each transmitter in the transmission terminal in accordance with the reduced adjustment for an associated channel (see col. 3, lines 59-67 to col. 4, lines 2-6, 14-46; the output of the transmitter is controlled by adjusting the optical attenuator which is inside the optical regulator OR(46)).

Regarding claims 27 and 34, as shown in Fig. 2, Dugan et al show reception terminal (32) and a non-terminal point in the transmission system (for example, non-terminal point could be the OR (46) shown in Figs. 2 and 3).

Regarding claim 29, Dugan et al disclose WDM system, as shown in Fig. 2, for a transmission system between a transmission terminal (12) and a reception terminal (32) having at least two channels (for example, CHAN1 and CHAN2) the system comprising:

determining an adjustment in accordance with fiber non-linearities of the system (see col. 3, lines 59-63 and col. 4, lines 2-6, 14-28, 38-46; the signal is received and compared, based on the comparison a feedback signal is provide to adjust optical attenuator; optimum balance or adjustment may also be determined from signal-to-noise ratio, which determined fiber non-linearity); and,

controlling an output of each transmitter in the transmission terminal in accordance with the adjustment for an associated channel (see col. 3, lines 59-67 to col. 4, lines 2-6, 14-46; the output of the transmitter is controlled by adjusting the optical attenuator which are within optical regulators, OR(46)).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-9 rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al (US Patent No. 6,157,475) in view of Khoe et al (US Patent No. 4,942,568).

Regarding claim 7, Dugan et al differ from this claim in that Dugan et al do not disclose a wavelength selective switch on at least one location in the transmission system, said wavelength selective switch allowing each channel to be processed by said processor. However, Khoe et al teach the use of wavelength selective switch to allow each channel to be processed by the processor (40) (see figure 2, Khoe et al

show wavelength selective switch (10) allowing each channel, (λ_1 to λ_N), coupled from coupler 13, to be processed by the processor (40)).

Due to large demand of information bandwidth, information signals are transmitted in multiplexed fashion comprising of multiple wavelengths. As the multiplexed signal travels on the transmission lines, signal quality degrades. Therefore, there needs to be a system which measures quality of the multiplexed signal including quality of each wavelength signal. Since the wavelength selective switch of Khoe et al is well known, therefore one of ordinary skill in the art would have been motivated to provide measurement system as taught by Khoe et al to measure and monitor signal quality of each wavelength in order to provide a robust communication system.

Regarding claims 8 and 9, as discussed above, the combination of Dugan et al and Khoe et al teach wavelength selective system and do not teach that the system can be located at plurality of locations in the transmission path. However, as the transmission line spans longer, it would have been obvious to provide the location of the wavelength selective switch at plurality of locations in the transmission path (including at the intermediate location) in order to obtain frequent measurements of the optical signal. The benefit of doing such is to minimize or eliminate noise within the optical signal.

7. Claims 3 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al (US Patent No. 6,157,475).

Regarding claim 3 (as far as understood), in col. 4, lines 29-46, Dugan et al teach adjustment of optical attenuator to regulate power level of the optical signal and differ

from this claim in that Dugan et al do not specifically teach adjustment of the optical attenuator to be within specific predetermined value such as 0.5. However, Dugan et al clearly suggest that the optical attenuator is adjustable. Based on this teaching, it would have been obvious to an artisan at the time of the invention to adjust the optical attenuator to be within the predetermined value such as 0.5. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C. 324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonie*, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to set the adjustment of the optical attenuator to be within an optimum or workable value or range, such as 0.5, by routine experimentation.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chraplyvy et al (US Patent No. 5,225,922) is cited to show optical transmission system equalizer.

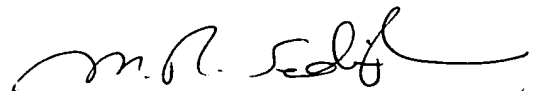
Terahara (US Patent No. 6,271,945) is cited to show apparatus and method for controlling power levels of individual signal lights of a wavelength division multiplexed signal light.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (703) 306-5619. The examiner can normally be reached on Mon-Fri 8am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

DS
November 26, 2003


M.R. SEDIGHIAN
Patent Examiner
Art Unit: 2633